DOCUMENT RESUME

ED 223 508 SO 014 378

AUTHOR	Carr, N. J.
TITLE	An Evaluation of the Use of Case Studies in Economics at Advanced Level in Schools. Research Papers in Economics Education.
INSTITUTION	London Univ. (England). Inst. of Education.
PUB DATE	Nov 82
NOTE	34p.; Not available in paper copy due to marginal legibility of original document.
AVAILABLE FROM	London University, Institute of Education, Department of Economics and Business Studies, 20 Bedford Way, London WC1H OAL.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Advanced Courses; *Case Studies; Comparative Education; *Conventional Instruction; *Economics Education; Educational Research; Foreign Countries; Secondary Education; *Teaching Methods
IDENTIFIERS	England

ABSTRACT

It is hypothesized that, in comparison to the traditional approach, the case studies approach is a more effective way to teach the concept of elasticity of demand. The sample consisted of 26 students, with an average age of 16 years, 9.3 months, who were enrolled in an advanced economics course in an English boy's school. The students were divided into two groups. One group was taught using the traditional approach, in which students were required to read and discuss textbook selections and listen to lectures. The second group read and discussed a case study, which is included in the document. Both groups were taught by the same teacher. Pre- and posttests were administered. No statistically significant difference was found between the scores of the students in the two groups. The use of the case study and the ability to participate in discussion did, however, have a positive effect on the students' interest in the lesson, thus validating the belief of the proponents of the case study method that the increased participation it involves will be a motivating influence. (RM)

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AN EVALUATION OF THE USE OF CASE STUDIES IN ECONOMICS AT ADVANCED LEVEL IN SCHOOLS

BY

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SO 014 378

Circulated by the Department of
Economics and Business Studies
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Summary

This paper examines the role of the case study in economics education at advanced level in schools. Section I outlines the approach adopted, defines the term 'case study' and considers the various types and the different ways in which they can be used.

Section II outlines the design of the experiment used to test whether the case study method is more efficient than the 'traditional' method of instruction. It sets out the procedure used and describes the sample selected. Section III outlines the traditional approach to the teaching of elasticity and setsout the teaching programme used and reviews the lessons taught. Section IV describes the construction of the case study, which was specifically written for this experiment and describes its use with the group and their answers to the questions it contained. Section V describes the test which was given to the students after they had been taught the topic and it describes the results. Section VI is the concluding section in which the results of the test are analysed, and considers the advantages and disadvantages of its use and the ways it could be improved in the future.

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Research Papers in Economics Education. University of London Institute of Education. Economics and Business Studies Department.

Author and Title

Number

1. B.D. Cressey. "The Provision of Economics Education in One London Borough" Nov. 1982.
2. N.J. Carr. "An Evaluation of the Use of Case Studies in Economics at Advanced Level in Schools." Nov. 1982

SECTION I: Introduction

Educationalists have as one of their main concern the desire to find the most suitable methods for conveying the concepts and encouraging the thought processes central to their desciplines. Experiments have been carried out in many subjects with new methods or curricula or both. The results of some of these experiments, e.g. the Schools Mathematics Project, have been favourable; other innovations, such as the use of language laboratories, have been less successful. Economics education has not been divorced from this process. Multiple-choice and data-response questions have been introduced by many examination boards at advanced level and there are moves afoot to amend syllabuses to include topics of modern concern such as comparative economics.

The aim of this paper is to examine the use of the case study in economics education at advanced level. The central part of this investigation is an experiment involving the comparison of two groups of students one of which was taught by the case study method. There are many strong arguments in favour of using case studies as illustrative material, to provide concrete opportunities for applying concepts previously taught by traditional methods. However, there has been little research done on the use of case studies as a means of presenting pupils with specific information from which they can deduce general concepts. This entails going from the particular to the general, rather than following the more common path in the opposite direction.

The experiment described below focuses on this. It involved taking two matched groups and teaching them the concept of elasticity, one in the traditional, textbook way, discussed later, and the other by means of a case study based upon the subscription rates, revenue and financial strategy of the Amateur Fencing Association. Both groups were then given an identical test, and the results are considered in the final section of the paper, which also discusses the possible role of the case study at advanced level in the light of the evidence presented here.

It would be useful at this point to clarify exactly what is meant by the expression 'case study' in the context of this paper. Different definitions of case studies exist, but their one common feature is that they all involve an extended study of a specific topic presented in great detail with a view to facilitating learning. Essentially, according to Sandford and Bradbury (1971a, p.4), 'a case study is characterized by being (a) detailed, limited and unified ..... examination of an actual or closely simulated economic problem, situation, event or development.' According to these authors, any such study, however used, can be regarded as being a case study, and they therefore include as case studies such strategies as role playing exercises, economic games which involve investing hypothetical millions on the Stock Market, field studies and simulations. However, for the purpose of this paper, the case study will be more narrowly defined, and taken to include only those instances where the student receives information to illustrate previously taught ideas or as a foundation upon which to base new material. There is still considerable scope for differences in the types of case studies in question and the ways in which they are used. They can either be 'primary', where the students investigate and analyse a situation, often of their own choice, com-

piling the data themselves through some form of questionnaire or survey, or they can be 'secondary', where the data has already been prepared and the basic problem(s) formulated by the teacher. Given a time constraint in sixth form education and the limited number of opportunities for students to collect their own data, most case studies are of the secondary type. The information involved may be imaginary or real, although in the latter case it is often necessary to simplify data in order to assist students to focus on the main issues involved.

SECTION II: The Design of the Experiment

This section outlines the following parts of the paper and sets out the rationale behind the experimental design used. The primary aim of this paper is to contribute to the debate about the use of the case study method. In order to go beyond a mere survey of the arguments advanced for and against its use, an empirical investigation was attempted. The performance of two groups, one taught by the use of a case study and the other by more conventional methods was compared. The experiment was carried out at an independent school in Essex.

Most of the literature concerning case studies has concentrated on their use to illustrate principles such as specialisation. Therefore it was decided to attempt to evaluate their use in an alternative process. The case study was presented and considered in detail so that the appropriate general principles could be deduced from it. The concept of elasticity was chosen in order to deal with the first constraint - that the topic chosen had to fit into the lower sixth syllabus at the appropriate time. Since there were no appropriate case studies available in the literature, one was specially written for the experiment. Its design and use will be discussed in detail below. The traditional method, used for the other group, was derived from a consideration of the major textbooks and its design and use will be fully discussed in the next section.

The sample:

There were twenty-six students involved in the experiment, this being the number studying economics to advanced level in the lower (first year) sixth form. Their ages ranged from 15 years 4 months to 17 years 8 months with an average of 16 years 9.3 months at the time of the experiment. Twenty-five of the students were male. The reason for the low number of female participants was that the school is predominantly a boys' school and admits only a small number of girls into the sixth form. It should be stressed that the sample was not typical of sixth form students since its source is an independent school and the sixth form contains a high proportion of direct grant pupils. Of the twenty-six involved, nine had gained a place in this way. The average number of 'O' Levels possessed by the students was 7.65 with the highest being eleven and the lowest four.

Procedure:

The hypothesis which the experiment was designed to test was that the use of a case study would be more effective in the teaching of the concept of elasticity than the traditional method. In order to test this, the students were divided into two equally sized groups with the group taught by the conventional method acting as a control group in the sense that they received the standard treatment, and the experimental group being the one taught by the case study method. In order to allocate the students to the two groups they were matched on the basis of an objective test of economic understanding given to them shortly before the start of the experiment. On the results of this, the students were paired on the basis of equal ability and were then allocated randomly to the two groups. Each group spent the same time on the topic - five 45 minute periods - this being the time normally spent on the topic and both groups were taught by the same teacher. At the end of the treatment a post-test, described later, was administered to the groups and the results analysed, using the 't' test, to see whether there were any significant differences in the scores of the two groups and also whether there was any interaction between treatment and ability.

The design of the experiment had a high degree of internal validity. The matching was efficient since there was considerable similarity between the content of the pre-test and the post-test and both were of the same type, thus removing a possible source of error. The effects of maturation can be ignored because of the short time involved as can regression towards the mean, a further source of error, because of the existence of both an experimental and a control group. Furthermore, since both groups were taught concurrently there was no possibility of outside events affecting students in one group and not the other. Since both groups were taught by the same teacher, there was no possibility that a difference in teaching could cause any variance in the results. However it should be remembered that the effectiveness of the teacher may depend upon the method he uses and also that the teacher had less experience in the use of case studies as compared to the traditional method. External validity might have been affected by the Hawthorne effect, but an attempt was made to prevent this by not informing the students that they were engaged in an educational experiment. The scale of the experiment and the fact that the students involved were of above-average intelligence, mentioned above, highlight the dangers of generalizing from the results of this study. Ideally, a larger sample involving a number of different schools and teachers should have been used, but this would have been beyond the scope of this experiment.

SECTION III: The Traditional Approach

When considering the traditional or conventional approach to the teaching of elasticity in the context of this experiment, there are three areas which merit discussion. The first concerns the content of the material; the second concerns its presentation and the third concerns the rationale behind its organization. The aim was to devise a scheme for the teaching of elasticity which would be recognized by teachers as being the traditional one, containing the appropriate content and arranged in an acceptable sequence, although it might not be the one which they actually used.

The content was derived from a study of three major advanced level textbooks; J. Harvey's Intermediate Economics, R.G. Lipsey's An Introduction to Positive Economics and G.F. Stanlake's Introductory Economics. There was considerable agreement between the authors as to the fundamental ideas of elasticity, but slightly less on the ordering of the ideas and the method of approach. Lipsey's treatment was the most detailed. He starts with the idea of the importance of knowing how demand responds to a change in price, considers this graphically, discussing why it is the percentage change which is important and then moves on to a formal definition. Following this there is an explanation of the terminology, the determinants of elasticity, how it relates to total revenue and finally, in an appendix, a discussion of the difference between arc and point elasticity. Harvey's treatment is far shorter, since he spends very little time introducing the concept or discussing income and cross elasticity of demand. Stanlake falls between these two extremes. He introduces the concept and relates it to total revenue, discusses the determinants of demand elasticity and describes the other types of elasticity in some detail. Nevertheless it was possible to combine the authors' ideas of content and sequence into the teaching programme below.

Teaching Programme: The Elasticity of Demand

1) The effect of a change in the price of a good on the quantity demanded.

This was intended both as a revision section and as an introduction to the ideas to be presented. Initially there was a review of what had been covered on the theory of demand some weeks previously. Topics revised included the factors affecting demand, the demand schedule, the demand curve and the difference between a movement of the curve and a movement along it. The section terminated in an examination of how a change in price affects demand, thus providing an initiation into the idea of elasticity.

2) The need to measure this effect, its importance to businessmen and the government.

This section pointed out why it was important for businessmen to know how far their pricing decisions would affect the quantity of their goods purchased, showing how one needed to compare both the price change and the quantity change in order to calculate the new total revenue. Similarly the government's influence on prices, through the imposition of taxes and subsidies, was discussed, and the relationship between price changes, quantity changes and tax revenue (or subsidy cost) considered.

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3) Definition of price elasticity of demand as a measure of the responsiveness of demand to a price change.

Having introduced the students to the idea that it is important to know how demand responds to a price change, this section simply related this to the concept of price elasticity of demand and defined it, acting as a link section between the basic introduction and the detailed discussion following.

4) Formula for calculating the price elasticity of demand; examples of goods with differing price elasticities.

Having defined the concept in the previous section, the next stage was to enable the students to quantify it by providing them with the formula:

$$\text{Elasticity of Demand} = (-)\ \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

The relation between elasticity and the proportionate changes in quantity and price was stressed. The terminology associated with the concept was introduced, with words such as elastic and inelastic being explained and related to the formula and to the definition.

(The first four sections took approximately one and a quarter periods to cover. During the lessons there was a strong emphasis on student involvement with the teacher asking the students question in order to elicit as much information as possible from them.)

5) Factors affecting the price elasticity of demand for a good.

This section examined the various factors which affect the elasticity of demand for a good; whether it is a luxury or a necessity, whether there are any substitutes and how close they are, whether it is a complementary good and, if so, how important it is in relation to the other goods involved, whether it is habit forming, the effect of advertising and the proportion of income spent on the good. With the exception of advertising, all of the above were produced by the class themselves with some prompting by the teacher, who asked what they thought the elasticity of demand for a particular good might be, cigarettes for example, and who then discussed why it would be so.

(Approximately one and a quarter periods were devoted to this section, a similar proportion of the total teaching time as is spent in the textbook.)

6) Price elasticity of demand and different demand curves - illustrations of demand curves with differing price elasticities and the idea that the elasticity of demand will change as one moves along a demand curve; the idea of arc and point elasticity.

This section started by introducing students to demand curves of infinite and zero elasticity of demand. After this they were asked to suggest what demand curves of unitary elasticity might look like. Incorrect suggestions were discussed before being rejected and the most common incorrect answer (of the form $p + q = k$ where p is a point on the vertical price axis, q is a point on the horizontal quantity axis and k is a constant) was examined and it was used to show that, with a straight line demand curve, the elasticity of demand ranges from infinity to zero as one moves along the curve from the vertical to the horizontal axis. The pupils were then given a

demand schedule and had to calculate, individually, the elasticity at different points to reinforce not only the idea of variable elasticity but also the method of calculation before progressing on to the curve of unitary elasticity. In order to stress the dangers of relying on a purely visual method of assessing elasticity, the same demand schedule was drawn a number of times, with different scales each time. Finally the difference between arc and point elasticity of demand was discussed. (This took three-quarters of a period).

7) The relationship between revenue and price elasticity of demand.

This was possibly the most complex section, especially for the students who were weak mathematically. Initially it was presented graphically. The area under the demand curve was equated with the total revenue from selling a particular quantity, and what happened to this area as price changed was investigated. For example, a proportionately small increase in price and large decrease in quantity was linked with a fall in total revenue and this was then related to a good for which the demand was elastic over the relevant price range. The same process was then done mathematically, by referring back to the formula for calculating elasticity, specifying an initial price and quantity sold and then considering the effect of price changes in total revenue as different elasticities were assigned to the good. Differential calculus was not used since not all the pupils were familiar with it. The effect of elasticity on revenue was then related back to section 2 and criteria for businessmen to raise or lower prices, in order to increase revenue, were stated in terms of the elasticity of the good concerned. There was also a discussion, along similar lines, of what goods the government should tax in order to maximise its revenue. The imposition of taxes and subsidies were then discussed graphically and the amount of tax raised contrasted for curves of differing elasticities. (This took three-quarters of a period).

8) Other types of elasticity of demand.

The students, in this section, were introduced to the ideas of the income and cross elasticities of demand. The treatment of both followed similar lines to the discussion of price elasticity of demand. The class considered how changes in income would affect the demand for different kinds of good and performed a similar exercise for changes in the prices of other goods. The importance of these concepts was discussed, they were formally defined and the relevant formulae provided. Hypothetical income elasticities of demand were suggested for luxuries, necessities and inferior goods and then the income elasticity of a demand for a good was related to its income-consumption curve. Possible cross elasticities of demand were compared for substitutes, complements and independent goods.

9) Factors affecting the above types of elasticity of demand.

A similar exercise to that undertaken in section 5 was undertaken in a similar way, first for income and then cross elasticity of demand.

(The last two sections were completed during the fifth period, leaving a little time for general questions on the whole topic.)

The style of teaching used was the same as in all previous lessons with the group, to prevent a change in style causing a change in performance. The style used could be described as formal. Pupils made their own notes throughout the lessons although key points, such as formulae, would be written on the board for them to copy down. The class were asked questions to elicit as much information as possible from them, as with the determinants of elasticity described in section 5, and also to check their comprehension of the areas which had already been covered. The questions were asked of specific students in order to test their understanding. If they were unable to respond correctly then other members of the class volunteered solutions. The particular topic was then reconsidered in order to ensure that the original respondent now understood the material.

The aim of the traditional approach was to enable the students to learn the information, to remember it and to help them organize it in such a way that it could be easily recalled when necessary. The general rationale adopted was based upon the principles outlined by Oliver (Oliver 1973) in advocating his 'sock it to them' approach to the teaching of economics. An attempt was made to present the material in such a way that the methodology and the deductions involved were clear and rigorous yet within the intellectual grasp of the students. Thus the sequencing of the material was such that any new information was related to material already known by the students and, where possible, illustrated by the use of examples. Thus, in the above teaching schedule, the first section was related back to the students' existing knowledge of demand and this was then used, in general terms, to discuss what happened when the price of a good changed. The idea of the demand for some goods being more responsive than others to changes in price was introduced to act as a link with what followed.

Throughout, the general principles were introduced, explained and discussed and then the more specific ideas were related to them. Thus, for example, the idea of elasticity of demand was introduced in general terms (section 3) and then its calculation (section 4) and the factors affecting it (section 5) were considered. Great care was taken, by the use of frequent questions to the students and very short exercises, to ensure that the existing material was mastered before new material was presented. The new ideas were related to material already learned, with similarities and differences identified to aid the absorption of the former into the students' structure of existing knowledge.

In order to ascertain whether the above teaching schedule was an acceptable representation of the traditional approach to the topic, a questionnaire was designed, setting out the schedule and asking respondents whether they regarded the approach as the traditional one, whether there were any alterations they would make to the content or ordering of the elements and asking whether there were any other comments they would care to make. (A copy of the questionnaire is included in Appendix I). It was sent to M.A. students ont he Economics Education course, both first and second year, at the Institute of Education, London University, and to a small number of other economics teachers. All agreed that the approach outlined could be regarded as the traditional one, although they did not all teach the topic in this way. The later questions revealed slight individual differences, one respondent preferring a more mathematical approach, one giving more priority to income and cross elasticity of demand, one teaching the determinants of elasticity last of all and one concentrating on the idea of total revenue earlier in the presentation and the difference between point and arc elasticity later. There were however no

common or fundamental areas of disagreement and therefore the schedule was followed in its original form, as set out above. It was also compared with past examination papers, of both the essay and multiple choice type, in order to see whether the information contained was sufficient to answer questions involving the elasticity of demand and it was found to be so for all relevant questions, of which a sample is set out in Appendix II.

SECTION IV: The Amateur Fencing Association - A Case Study.

Introduction:

The aim of the experiment, as has been stated in the previous section, was to examine the use of the case study as a teaching instrument in an inductive framework. This involves the transition from a concrete, real world situation to a theoretical one as a result of observations of the former. In Lesser's view (1978, p.9):

'a truly inductive methodology would start with the real world experience and through an analysis of that situation bring the student to a point where he saw the need for a theory and/or recognized the usefulness of a particular theory that would be introduced at that time. ... Through the use of case studies, as the initial teaching vehicle, a start is made with the specific before moving to the general. Students have to grapple with a particular problem before attempting to perceive it in its broader theoretical context. Thus the need for theory is created and the theory becomes relevant.'

This approach was applied to the teaching of elasticity in the hope that the students' ideas concerning it and their understanding of it would be enhanced by a study of the Amateur Fencing Association and its dilemma. It needed to raise revenue by increasing membership fees without losing an excessive number of members, which would make the increase unprofitable - a tailor-made elasticity problem. The use of the case study prior to the study of elasticity contrasts with the more usual approach of using it, in a deductive way, as illustrative material after the subject has been taught.

The construction of the case study was heavily influenced by the principles outlined by Warner and Fuchs (Warner 1960) which were based upon their running of an economics first year course at Columbia University taught entirely by the use of case studies. Although this particular course was aimed at mature students, the approach adopted was applicable in wider circumstances. From their experience of running this course, Warner and Fuchs suggest a number of guidelines for the construction of cases. First, the case should be brief so as not to raise too many issues which would detract from the main area being studied and possibly confuse the issue. Other reasons for keeping the case short were the time constraint involved, five 45 minute periods, and the desire to present a case which was comprehensible to the average sixteen year old while still being sufficiently broad to be a worthwhile area of study. Secondly, the case should end with a number of questions which focus attention upon the key areas being studied. The questions set were of three basic types. Questions 1 and 5 aimed to test comprehension of the material involved, thus attempting to ensure that the case was properly read. Questions 3 and 4 were intended to channel the students' efforts into fruitful areas while the remaining questions, being open-ended, called for the use of more analytical techniques. The third guideline presented by Warner and Fuchs is that the students should be able to examine the conclusions reached in

other similar circumstances. No attempt was made to do this in the case study itself but, during the following discussion, the students' attention was drawn to the situation facing football clubs experiencing falling gates. Fourthly, Warner and Fuchs suggest that if the case studies comprise a course, they should be based upon as many different situations as possible. If one is, as in this instance, using just one case study the point is of little relevance; nevertheless an attempt was made to select a subject which would be of interest to the students while being outside their normal field of study. The final guidelines the above authors lay down are that the cases should acquaint the students with the sources of economics information and, whilst enabling them to acquire a set of tools suitable for tackling economic problems should point out the limitations of the techniques and data with which they are working. An attempt was therefore made to design a case study which involved the manipulation of primary data. Furthermore, in the discussions, and especially those about question 6, emphasis was placed upon the deficiencies of the information presented and the need for further research.

LOWER VI ECONOMICS

The Amateur Fencing Association - A Case Study (September 1981)

Background Information

Fencing is organized in Britain by the Amateur Fencing Association (AFA) in the same way as football is the responsibility of the Football Association. Through various committees, the AFA organises courses and competitions, chooses British teams at all levels, decides on matters of policy, trains amateur coaches, determines the rules of the sport, and is responsible for fencing in schools and clubs. The country is divided into fourteen sections which mirror the AFA's activities at a local level. There are approximately one thousand fencing clubs in the country which are run as evening classes, or operate in schools or colleges. Half these clubs pay an affiliation to the AFA but there is no compulsion upon them to do so. However, affiliation enables members to take part in most competitions and the club receives a copy of the AFA magazine 'The Sword', a fixture list of competitions and courses, and the AFA annual report. There is no compulsion upon individual fencers to join the AFA unless they wish to receive 'The Sword', fence in the British Championship or international competitions in this country. For all other purposes, membership of an affiliated club is sufficient.

The present level of subscription as follows:

Clubs:	Adult	:	£7.50 p.a.
	School	:	£5.00 p.a.
Individual:	Under 18	:	£1.00 p.a.
	Under 20	:	£3.00 p.a.
	Adult	:	£7.00 p.a.

The problems of the AFA

Subscriptions have been held constant since the last rise in 1977 and, as the following table shows, revenue from all sources except government grants has been declining. This is particularly serious when one considers the rate of inflation during this period.

AFA Income and Expenditure 1975/6 - 1980/1[1]

	1975/6	1976/7	1977/8[2]	1978/9	1979
Subscription Income:	6,847	6,734	11,763	11,415	11,023
Government Grants:	25,799	28,086	35,079	38,137	35,420
Revenue from competitions, courses, etc:	3,728	4,752	4,072	4,190	3,767
Total income:	36,374	39,572	50,914	53,742	50,210
Total expenditure:	32,179	41,397	45,991	51,732	52,337
BALANCE:	+4,195	-1,825	+4,923	+2,010	-2,127

SOURCE: AFA ANNUAL REPORTS 1976, 1977, 1978, 1979, 1980.

1 - All figures in current prices
2 - Rise in subscriptions

Expenditure is expected to be of the order of £68,000 in 1981/82 and, assuming 10% inflation p.a., approximately £82,250 in 1983/4. Over the past five years approximately 70% of expenditure has been met by the government; in the present economic climate this is unlikely to be increased and the AFA is, therefore, seeking to obtain a minimum income of £20,000 from subscriptions. However, this has to be reconciled with the decline in membership over the last three years in all groups except Under 18 members; (see following table).

AFA Membership Figures - 1978-80

	1978	1979	1980
Adults	1,079	1,070	982
Under 20	177	200	183
Under 18	657	594	949
Adult Clubs	277	285	271
School Clubs	288	253	243

SOURCE: AFA ANNUAL REPORTS 1978, 1979;
AFA MEMBERSHIP FILES

This decline is itself a problem. If membership is not buoyant even when subscription rates are static in money terms, and falling in real terms, the implications for membership if fees are raised are likely to be serious.

Possible Solutions

In order to solve its problems, the AFA considered a number of solutions concerned with building up a broad membership base among 20,000 people or so who fence (as compared to the 2,000 who belong to the AFA) and at the same time setting fees at a level which would maximise income. The first solution proposed was for subscription rates as follows:

Adult £10
Under 20 £ 5
Under 18 £ 2
Adult Club £15
School Club £ 7

The rationale behind these rates was that membership was not greatly affected by price and therefore one could afford to charge high rates. The second solution was to keep the individual rates the same as previously but to increase the club rates for school and adult clubs by 100%. It was also felt that AFA individual membership should be compulsory for all competitions under both schemes. This would, for the first time, include an insurance policy covering members against accidents sustained whilst fencing.

Questions: In answering the following questions you might like to consider the following additional information:

1 Membership Characteristics of other sports:

The subscription systems of other sports are not very suggestive for re-shaping that of the AFA. Sports vary so much in their nature, the number of practitioners and their organisational structure. It is also difficult to ascertain the relevant data. Here is a sample list of sports which share certain characteristics with fencing.

Badminton: Subscription £9 4,801 clubs, 116,784 total club membership.
Gym: Subscription £10 (incl. 12 issues of magazine.) 6,500 clubs in 1976.
Handball: Subscription £2.50 via member club. 3,500 - 4,000 members.
Hockey: Subscription £2 approximately via team, plus £5 for 5 issues of magazine. 30,000 members in 1976.
Table tennis: Subscription £8 for 8 issues of magazine.
Squash: Subscription £6.50, 12 issues of magazine.
Air Rifle and Pistol: £6.25 club subscriptions; £1.80 subscription for club member; £4.75 for individual member. 141 clubs; 1903 (+307) individuals.

2 Types of fencer:

For their analysis of the effect of the subscription rates on membership, the AFA identified three types of fencer.

a) The social fencer, i.e. club members who rarely compete in competitions. This category comprises the majority of adult fencers.

b) The competitive adult fencer comprising the bulk of the adult membership of the AFA. He or she is the person who gets most benefit from membership.

c) The School Fencer.

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1 What are the factors which affect the demand for a good? Which of the above are likely to apply to AFA membership? Are there any special factors which might be involved?

2 What difficulties might be encountered if the AFA decided to make membership compulsory?

3 A firm's revenue is calculated by multiplying the price of the goods by the quantity sold. Why will a rise in price not necessarily increase revenue? For what goods will a rise in price not lead to a rise in revenue and for what goods will it do so?

4 Calculate the AFA's expected revenue from subscriptions for both of the proposed systems of charging:

a) on the basis of the 1980 membership figures.

b) on the basis of a 10% fall in membership.

c) on the basis of a 20% fall in membership.

5 Summarise the problems faced by the AFA at present. Do you think that these will become more serious if no changes are made? What is your evidence for your answer to this question?

6 You are a business consultant who has been appointed to advise the AFA on its best course of action. From the information given, set out your recommendations as to its subscription rates and any other policies it should embark upon to improve its financial position.

The Use of the Case Study

The information in the following section is derived from notes compiled by the teacher at the end of each lesson.

Lesson I:

Since it was the first time that a case study or anything similar had been used with the students, ten minutes of the first lesson was spent explaining what they would be doing during this lesson and the following four, why they were being given the material, how the study of economics could be related to real-life problems and generally providing them with an introduction to the case study rationale. They were, however, not told that they were participating in an educational experiment in order to remove, as far as possible, any likelihood of the Hawthorne effect occurring. The material and questions were then distributed and the class proceeded to read through it. This took approximately fifteen minutes. After this they asked any questions they wished to, concerning the content of the case study. These were aimed at clarifying the membership structure of the Amateur Fencing Association, defining various terms such as "current prices" and "real terms" explaining what was to be included in the insurance policy, what the government grants were used for and elucidating the meaning of the questions. They were asked to consider the questions prior to the next lesson.

Lesson 2:

At the start, the students were divided into four groups to consider the questions in detail and prepare answers which a member of the group would present to the remainder of the class when they regrouped. Allocation to the groups was done with considerable care, to ensure that certain combinations of students were avoided in order to encourage the maximum participation from all those involved. It was noted that during these discussions there was far greater participation than was common during traditional lessons, normally reticent students being encouraged by the small group format.

Lessons 3 & 4:

The groups reassembled and the questions at the end of the case study were considered. A spokesman, changed for each question, was asked for the group's solution to each question. After these were presented, the teacher, acting primarily as a chairman, selected areas of disagreement amongst the groups, which were reconsidered and clarified certain aspects which had been inadequately appreciated by the students.

1) What are the factors which affect the demand for a good?
   Which of the above are likely to apply to AFA membership?
   Are there any special factors which might be involved?

Answer:

There was general agreement as to the importance of the price of Amateur Fencing Association membership as well as the price of complements - kit, club and tuition charges - and the price of substitutes - primarily the cost of other sports. Income was also felt to be important since fencing clubs tend not to attract the low income earners. (This was later related to the idea of income elasticity of demand). Other factors such as tastes and advertising were felt to be relatively unimportant in this case.

2) What difficulties might be encountered if the AFA tried to make membership compulsory?

Answer:

The students decided the main difficulties were in enforcing such a rule. However several students suggested that the imposition of the regulation would cause some people, especially the social fencer, to give up fencing and switch to other sports. This led to a consideration of the issues raised in question 3.

3) A firm's revenue is calculated by multiplying the price of the goods by the quantity sold. Why will a rise in price not necessarily increase revenue? For what goods will a rise in price not lead to a rise in revenue and for what goods will it do so?

Answer:

All the students questioned by the teacher showed by their answers that they saw that a rise in price might cause a fall in quantity and this could offset the increase in price. One group suggested that it would be useful to try to measure this likely effect prior to a change in price in order to assess its viability.

There was some confusion over the second part of the question, with some of the students thinking that it would only be in the case of Giffen goods where an increase in price caused an increase in revenue but, after discussion it was generally appreciated that what was important was the relation between the change in price and the change in quantity.

4) Calculate the AFA's expected revenue from subscriptions for both of the proposed systems of charging:
   a) on the basis of the 1980 membership figures
   b) on the basis of a 10% fall in membership
   c) on the basis of a 20% fall in membership

Answer: Membership system 1

Unchanged membership	Revenue	£18,399
10% fall in membership	Revenue	£16,559.1
20% fall in membership	Revenue	£14,719.2

Membership system 2

Unchanged membership	Revenue	£15,358
10% fall in membership	Revenue	£13,822.2
20% fall in membership	Revenue	£12,286.4

The teacher then led a discussion which was intended to ascertain which of the above outcomes was the most likely. The students appreciated that scheme 2 (with individual membership fees unchanged) might in fact be better if the fall in the membership in scheme 1 was unduly large.

5) Summarise the problems faced by the AFA at present. Do you think that these will become more serious if no changes are made? What is your evidence for your answer to this question?

Answer:

The answers to this question and the discussion in class centred around the information contained in the case study although some of the groups attempted to apply their knowledge of other associated circumstances, such as football, to the question. It thus fulfilled its aim of ensuring a thorough reading of the case study.

6) You are a business consultant who has been appointed to advise the AFA on its best course of action. From the information given, set out your recommendations as to its subscription rates and any other policies it should embark upon to improve its financial position.

Answer:

The answers to this question given by the groups were generally wide-ranging and imaginative, given that the nature of the sport was largely foreign to the majority of the students. Advertising, sponsorship, fund-raising and gala matches were discussed, as well as the major issue of what to do with the subscription rate in order to maximise revenue.

Lesson 5:

This lesson was used to draw upon the ideas generated in the previous four and relate them specifically to the concept of elasticity in a formal way. Basic information, such as the formula used to calculate price elasticity of demand, was provided by the teacher, but the majority of the information was derived from the answers to the case study. Thus, for example, the connection between changes in marginal revenue and the price elasticity of demand was related to the answers to questions 3 and 4. The next lesson was used to give the students a test, which is described below.

SECTION V: The Test

The test (see Appendix III) constructed for this experiment was composed entirely of questions set in the Joint Advanced Level Multiple Choice Examination Papers during the period 1976 to 1980 inclusive. This is a multiple choice examination which is used jointly by the Oxford, Cambridge, Northern Ireland, Welsh and Oxford and Cambridge examination boards at advanced level. The time available to students in which to answer it was thirty minutes, two minutes per question, which was similar to the advanced level format where fifty questions are answered in one hour and forty-five minutes. It was evaluated in order to form the basis of a discussion of the results of the above experiment. However, it was presented to the students as being simply a test at the end of a particular topic. An objective test format was used in order to be able to examine the whole of the topic since it was felt that this could not be done with another type of examination in the time available. It would, for example, only have been possible to write one essay or answer one data-response question in the time and this would not have been adequate for total assessment. A further reason for rejecting the essay was that it might have provided the case study group with an unfair advantage since they would have had a ready-made example to use in explaining elasticity and its uses. The essay was also rejected because of the difficulty in producing an objective judgement of each piece of work.

The test aimed to examine, as far as possible, the students' knowledge and understanding of elasticity of demand rather than to test any knowledge previously acquired of other aspects of micro-economics. Careful choice of questions ensured that the content validity was high. By using questions from an established source it was felt that a high degree of reliability could be obtained. Another intention in selecting the questions was that they should test different levels of attainment and all the mental processes involved in the use and applications of elasticity of demand. Table 1 sets out the source of each question, the correct response and the proportion

choosing the correct response, together with the examination boards' estimate of what skill each question is testing. Although not identical with it, their classification is based on Bloom's Taxonomy of Educational Objectives and a full description is given in Table 2.

TABLE 1: AN ANALYSIS OF THE TEST ITEMS

Item	Source	Skills	Key	Proportion Choosing Key*
1	1978 Q.4	Knowledge	D	0.85
2	1978 Q.5	Interpretation	A	0.69
3	1977 Q.8	Interpretation	C	0.67
4	1978 Q.7	Application	A	0.65
5	1977 Q.4	Knowledge	C	0.40
6	1976 Q.8	Interpretation	D	0.45
7	1979 Q.5	Translation	A	0.48
8	1976 Q.9	Analysis	A	0.14
9	1978 Q.9	Translation	D	0.40
10	1978 Q.23	Interpretation	A	0.64
11	1976 Q.16	Interpretation	A	0.51
12	1976 Q.6	Translation	C	0.67
13	1976 Q.7	Translation	B	0.63
14	1979 Q.6	Interpretation	C	0.61
15	1980 Q.8	Analysis	E	0.25

* National figures.

TABLE 2: A CLASSIFICATION OF ABILITIES TESTED

KNOWLEDGE is the ability to recognize and recall a piece of information presented in the course of instruction. This may be in a symbolic form (e.g. the shape of a particular curve on a graph) or in verbal form, but it must be tested in a context very similar to the way in which a candidate met it during his preparation.

COMPREHENSION may be subdivided into Translation and Interpretation.

TRANSLATION is the lowest of the skills above Knowledge. The ability to translate may include the ability to make new associations by recognizing that data presented in one form (e.g. graphical) are equivalent to data recalled in another form (e.g. verbal) or that freshly presented information represents a particular case of a general situation which is recalled. If a principle has to be applied to the data, it will immediately be obvious to a well-prepared candidate which principle he should apply.

INTERPRETATION is like Translation in that the candidate should be clear about what he is required to do with the information. But an interpretation item will demand some reordering of the data presented and/or the recognition of the essential elements among the information presented before the candidate can carry out the task required by the item.

APPLICATION is the ability to select an appropriate known principle in a situation not previously encountered, to restructure the data in a suitable form, and so to apply the principle. An important distinction between Comprehension and Application is that a candidate with the former ability can apply a principle when specifically asked to do so but it requires the latter ability for a candidate to recognise by himself the principle involved, to select the means of solution and to solve the problem presented.

ANALYSIS is the ability to search through data and use Application skills along with that part of the data which is identified as relevant to the problem presented.

Source: Inter-Board Multiple Choice Economics 1976, p. 7-9

Analysis of Test Results

The scores of the students in the test are set out in Table 3 with the students ranked according to their performance in the pre-test. The difference between each matched pair is set out in the final column. Appendix IV contains the results of the tests.

Table 3: STUDENTS' TEST RESULTS

Traditional Method		Case Study Method		Difference
Pupil	Score	Pupil	Score	
1	13	1	8	-5
2	9	2	6	-3
3	11	3	10	-1
4	10	4	9	-1
5	7	5	9	2
6	10	6	8	-2
7	9	7	9	0
8	10	8	7	-3
9	6	9	6	0
10	8	10	10	2
11	6	11	8	2
12	6	12	5	-1
13	10	13	9	-1

In order to test whether these differences were significant, a one-tailed 't' test was carried out and it was found that the mean score of pupils taught by the traditional method was higher (8.8462 compared with 8.000); the difference was not significant at the 95% level ($t = -0.4000$, 12 Df) and there were no grounds for rejecting the null hypothesis that there was no difference between the matched groups as a result of the different teaching methods. Details of the

calculations are set out in Appendix IV. In order to test whether the effect of the case study method was the same at different ability levels, the students were split into two groups, a 'high' ability group comprising matched pairs, one to six inclusive, and a 'low' ability group comprising matched pairs, eight to thirteen inclusive. The null hypothesis, that there was no difference between the effects of the treatment on the 'high' and 'low' ability groups was tested (see Appendix 6) and it was found that the mean difference with the 'high' ability group was -1.6667 compared with -0.1667 with the 'low' ability group. However, this also was not significant at the 95% level ($t = -1.2095$, 10 Df) and therefore there was no basis for rejecting the null hypothesis that there was no interaction between treatment and ability.

The results of the tests therefore show that there is no difference between the two methods either in the average scores or the performance of the 'high' and 'low' ability students in either method.

Section VI. Conclusion

Before discussing the results of the experiment, it should be reiterated that the degree of generalisability is low. The sample was small and non-typical, being almost exclusively male (twenty-five out of twenty-six students) and had an average of 7.65 'O' levels passed; it was taken from only one school and involved only one teacher. Therefore the results and conclusions should be treated with caution.

In comparing the two methods of instruction and making recommendations as to the possible use of case studies at advanced level, it is necessary to remember that each method embodies a number of different effects which might have been responsible for the students' performance, and to talk simply of 'the use of a case study' is an oversimplification. These different effects are of necessity difficult to assess. One does not know whether the teacher's enthusiasm for the case study method communicated itself to the students and, if so, what effect it had on their performance; the novelty of the method might have increased the level of attentiveness. The method of assessment was possibly geared towards the traditional method of teaching. A different type of examination, such as an essay or a data-response question, might have produced an alternative result, possibly one favourable to the case study group, since it would have provided them with an opportunity to display the understanding which it was intended that they achieve during the use of the case study. This understanding, such as the application of knowledge from different fields of economics, the correct use of value judgements, taking a wide perspective and the development of powers of creative analysis, are difficult to examine with an objective test because of the nature of the questions. No attempt was made, because of the length of time involved, to test whether either group retained their understanding better by re-testing the groups after, for example, a six month period. It is possible that such a test might show one group to be superior, with implications for the use of each method.

If the experiment were to be repeated or even if the case study were to be used again in the future, there are certain improvements which could be made. These changes would affect the way the case study is used and also the material itself. The first recommendation is that more time should be devoted to the case study, both to allow the small groups more time to consider their solutions to the questions and to permit the whole class more time to discuss the solutions. In discussion about the use of the case study with the students after its use, a majority expressed the view that they found themselves to be short of time and that there were many avenues which they did not explore fully because of this. If there were more time for class discussion, the teacher would have a greater opportunity at this stage to encourage students to explain the analysis upon which their conclusions were based, rather than merely presenting their conclusions. This would thus reduce the danger that there might be merely the illusion of good discussion, arising solely because everyone contributed, regardless of the worth of their contribution. The questions at the end of the case study should be changed to make them more structured; the small number of longer questions should be replaced by a greater number of shorter questions. This would be of most benefit to the weaker students who,

at times, found themselves uncertain of the direction in which they were supposed to be progressing. There should be more attention drawn, both in the text and questions, to the relevance of the problems face by the Amateur Fencing Association, to other institutions and sports, such as the falling gates of ailing soccer clubs. An extra question should be added, requiring the class to evaluate the likely consequences of the action actually taken by the Amateur Fencing Association.

With the above provisos, the results of the experiment, that there is no statistically significant difference between the students' scores on either method, can be interpreted to support two alternative conclusions. The first is that since there is no advantage in using the case study, as measured by a gain in scores, one should therefore retain the traditional methods of instruction. An alternative view is that since neither method produces any significant difference in students' learning, as measured by the test, one should consider the less tangible, less easily measured benefits which might result from using a variety of teaching techniques.

The results of the test showed that there was no significant interaction between the ability of the student and the treatment received; the more able students (as measured by the pre-test) did not do significantly better on one method than another. This refutes the view that case studies are only suitable for the more able students since they provide them with greater scope to use their talents and they are the only ones with the ability to benefit fully. All students appeared to experience the benefits of the case study method. These benefits involve introducing students to problems which have no clear-cut solutions, and which require the exercise of judgment and speculation on possible future events in the same way that professional economists have to operate. It was noticeable that the less-able students initially found this difficult to do, and, to the extent that they found it easier as they persevered with the case study, they gained from its use. Although not an integral part of this particular case study, students benefitted from practising basic skills involving the manipulation and interpretation of data. They also had the opportunity to engage in discussion with their peers while considering the case study in small groups, left to their own initiative, largely supervised by the teacher. Because of the small group format, with students in groups of four, it was very difficult for them not to participate at some stage. It was noticeable that this involved even those students who did not usually contribute to discussions in class unless specifically asked questions. Although group leaders were not appointed, the groups were able to organise themselves in such a way as to operate efficiently, dividing up the necessary tasks and usually selecting one person to make notes and, once the novelty of the format had worn off, they quickly settled down to an examination of the material and a discussion of the solutions to the questions. Since it was impossible to monitor each group continuously, one does not know whether there was a high standard of discussion throughout or whether the contributions from some students were of little value with them acting as 'free riders' on the backs of the other students. This is a difficulty with any teaching methodinvolving discussion, but it was intended that the careful selection of the groups prior to the experiment would eliminate this as far as possible. Quiet students were arranged with similar students to ensure participation and, where this did not clash with the above matching, groups were composed of students of similar intelligence as measured by their performance on the pre-test they were given.

The use of the case study and the ability to participate in discussion had a positive effect on the students' interest in the lesson, thus validating the beliefs of the proponents of the case study method that the increased participation it involves will be a motivating influence. Evidence of the level of students' interest is not based on any empirical evidence but is a purely subjective opinion, gathered from discussion with the students following the use of the case study and the teacher's own opinion of the students' attitude during the lessons. One would have to repeat the use of case studies in the future to decide whether the increased interest was because of the novelty or because of the nature of the case study method. What is implied is that at least the occasional use of the case study method will be advantageous simply for the purpose of providing variety in the normal teaching programme and stimulating students to take a greater interest in the subject.

Nothing has as yet been said about the way the teacher will be affected by the use of the case study. This role, although less obvious than in the traditional 'chalk and talk' method, is equally important. He has to be able to direct the discussion, weaving the various threads together and allowing it to progress without discouraging any individual contribution and without dominating it. Yet he has to preserve a degree of control sufficient to point the students in the appropriate direction, while simultaneously allowing them the freedom to explore different facets of the problem which occur to them. At the same time, he has to maintain the interest of all the students and encourage a high level of participation in an attempt to achieve an equality of effort among the students. He must be able to answer questions concerning the case material and suggest further references when required, thus necessitating a considerable knowledge of the case material. Above all, he must ensure that what is happening is analytical rather than merely anecdotal. To do all this requires skills which the teacher must himself acquire and which are only likely to be mastered through practice in the use of case studies. It is easy to underrate the difficulty of this, assuming merely that one only has to give the class material and then adopt a 'let's finish off with a discussion' approach. Not only does the material have to be mastered (and in some cases prepared) by the teacher, but the various avenues which the discussion can take also have to be considered in detail beforehand. Besides being able to operate a case study successfully in the classroom, there are other areas of concern for the teacher. It is likely to take longer to cover material than a more conventional technique. This is supported by the experiment described above when it was felt that an extra period would have been useful. Therefore, if the case study is to be used extensively, one is likely to have to sacrifice breadth of coverage for a more detailed study of certain areas. Because of the time involved and the responsibility case studies place upon the teacher, the most efficient way of using them may be sparingly in order to ensure that they are utilised to their full potential. One way in which they can be most useful, from the author's experience at advanced level, is as a revision aid, when they can be used in the context of broad areas of the syllabus, linking various branches of economic theory together. Only if used at this stage of the course can those case studies which are wide-ranging be fully appreciated.

To conclude, the reasons for the use of case studies at advanced level can be divided into two broad categories. First, as investigated in the experiment described above, they provide a means of introducing students to the inductive methodology which is relevant to economics. The student is provided with information and moves from this towards the theory rather than proceeding in the opposite direction as is more usual in advanced level courses. As the experiment showed, it is no less satisfactory than the deductive method in educating students and, because of the other benefits associated with it, discussed above, it can be regarded as a suitable method of instruction for advanced level students.

In a deductive framework it is useful in helping students to apply theory. They are given the case study after learning material presented in a traditional manner and the case study acts as an extended example, but one where they are likely to gain additional benefit from engaging in extensive discussion and from practising the skills associated with problem solving, both of which have been discussed earlier. The student is likely to gain since he will be applying his economic skills in unfamiliar situations and practice in this will make him more proficient than if he were merely using conventional classroom examples. Rather than assuming, as often implicitly happens, that if students learn theory they will automatically learn how to apply it, one is, through the case study, providing them with additional opportunities to apply the theory and, furthermore, the teacher can assist in the process. The application of theory to reality is not easy for the average advanced level student and, by using a case study, the teacher can assist in the process. If the case study works well, the teacher can ensure that memory is subordinated to original thought and that the student exercises higher mental processes than often occurs in the traditional lesson. The case study can combine the acquisition and practice of analytical skills, understanding of economic matters associated with the study of economic theory and the satisfaction which results from discussion of matters of interest to sixth form students and, therefore, can be regarded as being a valuable weapon in the advanced level economics teacher's armoury.

Appendix 1: The Elasticity of Demand Questionnaire

I am attempting to reach a consensus of opinion regarding the teaching of the concept of elasticity of demand at A-level and I should be most grateful if you would read the following programme for teaching this topic and then answer the questions printed below.

Thank you.

N.J. Carr.

TEACHING PROGRAMME - THE ELASTICITY OF DEMAND

1. The effect of a change in the price of a good on the quantity demanded.
2. The need to measure this effect - its importance to businesses.
3. Definition of price elasticity of demand as a measure of the responsiveness of demand to a price change.
4. Formula for calculating price elasticity; examples of goods with differing price elasticities.
5. Factors affecting the price elasticity of demand for a good.
6. Price elasticity of demand and different demand curves - illustration of demand curves with differing price elasticities and changing price elasticity along with demand curve, the idea of arc and point elasticity.
7. The relation of revenue to price elasticity of demand -

   graphical illustrations
   mathematical illustrations.

8. Other types of elasticity of demand -

   income elasticity of demand
   cross elasticity of demand

9. Factors affecting the above types of elasticity of demand.

a. Do you regard this approach as the 'traditional' one?
b. Are there any alterations or additions which you would make to the content?
c. Are there any alterations you would make in the ordering of the elements of the treatment?
d. If you use a different method of teaching this topic, please summarise it briefly.
e. Are there any other comments you would care to make?

Appendix II: A sample of essay and data-response questions

Essay Questions:

Why would you expect the price and income elasticities of demand for petroleum to be higher in some markets than in others? Analyse the effects of a substantial increase in the import price of petroleum on the main British users.(Cambridge Examination Board).

Explain whether and why you would expect the demand for foreign holidays to be relatively elastic or inelastic to changes in their price. How is a fall in the foreign exchange rate likely to affect the demand for foreign holidays? (JMB).

Data-Response Question: The following is the demand schedule for a product:-

Price (£)	Quantity sold ('000s) per period
50	24
32	37.5
30	40
25	48
20	60
15	65
10	80

(i) Calculate the price elasticities of demand between:

(a) £50 and £32
(b) £32 and £30
(c) £30 and £25

Use the proportionate change in demand/proportionate change in price method.

(ii) What is anomalous about these results? What does this tell you about this method?

(iii) Discuss the relationship between price elasticity of demand and marginal revenue between the prices of £20 and £10.

(iv) The relationship between price (p), marginal revenue (mr) and price elasticity (e) is sometimes expressed as:

$$mr = p \left(1 - \frac{1}{e}\right)$$

Explain the relationship between this and the practice of discriminating monopoly.

(Source: Oliver 1982, p. 7)

(No multiple choice questions are included since a selection of these is used in the test used to evaluate the experiment).

Appendix III

LOWER VI ELASTICITY OF DEMAND TEST - WINTER 1981

Attempt all questions, writing your answers on the sheet provided.

Time: 30 minutes.

1 Income elasticity of demand for a commodity measures the responsiveness of

A. Income to changes in quantity demanded
B. Price to income changes
C. Income to changes in price
D. Quantity demanded to changes in income
E. Quantity demanded to changes in quantity supplied.

2. The cross elasticity of demand of good X with respect to good Y is

A. $\frac{\text{Percentage change in quantity demanded of good X}}{\text{Percentage change in price of good Y}}$

B. $\frac{\text{Percentage change in quantity demanded of good Y}}{\text{Percentage change in price of good X.}}$

C. $\frac{\text{Percentage change in quantity demanded of goods X \& Y combined}}{\text{Percentage change in their joint prices.}}$

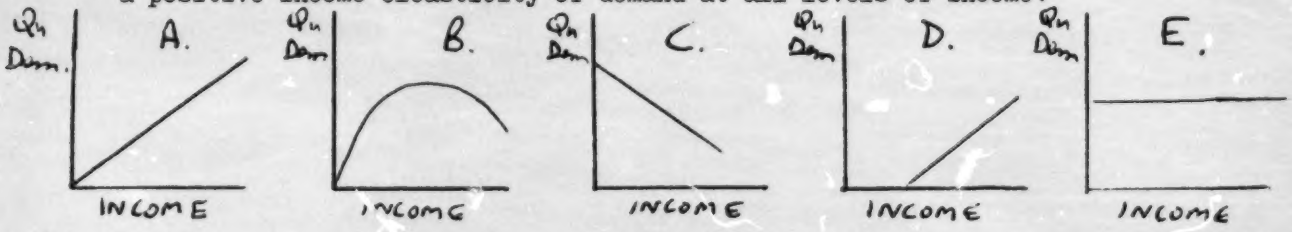
D. $\frac{\text{Percentage change in quantity demanded of good X - Percentage change in quantity demanded of good Y}}{\text{Percentage change in price of good X - Percentage change in price of good Y}}$

E. $\frac{\text{Percentage change in quantity demanded of good X}}{\text{Percentage change in quantity demanded of good Y}}$

3. Mr. X. had intended to borrow £5,000 at 8% per year for house purchase. When the interest rate rose to 10%, he decided to borrow only £4,000. His price elasticity of demand for loans lies in the range

A. 0.00 to 0.39
B. 0.40 to 0.79
C. 0.80 to 1.29
D. 1.30 to 1.79
E. 1.80 to 2.50

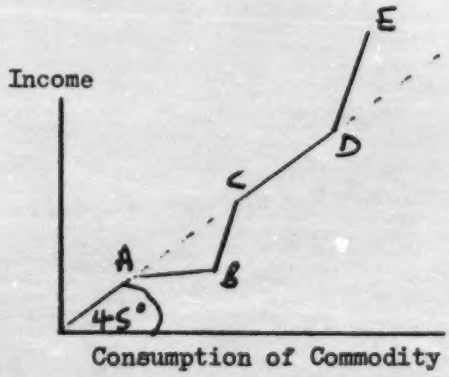
4. Which one of the following graphs refers to a good which exhibits a positive income eleasticity of demand at all levels of income?



5. If a downward sloping demand curve is a straight line, the elasticity of demand, defined as a positive number, for the commodity

A. is unity
B. is infinity
C. decreases as quantity increases
D. increases as quantity increases
E. is constant and less than one

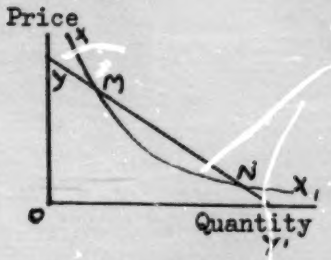
6.



Within which of OABCDE is the income elasticity of demand for X greater than 0 and less than + 1?

A. AB only.
B. OA and CD
C. AB and BC.
D. BC and DE
E. DE only.

7.



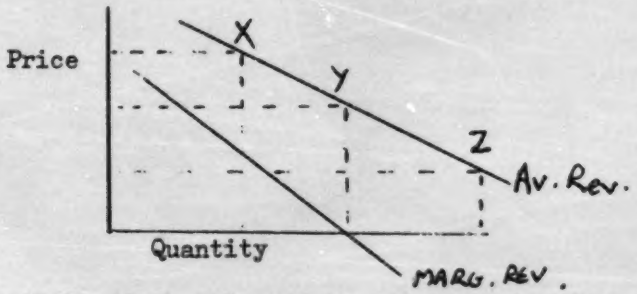
In the above diagram, the demand curve XX' is a rectangular hyperbola; the demand curve YY' is a straight line. It follows that

A. XX' has the same elasticity at all points.
B. YY' has the same elasticity at all points.
C. YY' is less elastic than the curve XX' at the point M
D. YY' is more elastic at the point N than it is at M
E. XX' is more elastic at the point N than it is at M.

8. If the demand curve for a good makes a parallel shift to the right and the equilibrium price is unchanged, the price elasticity of demand will now be

A. less because consumers are less sensitive to price changes.
B. less because consumers are more sensitive to price changes.
C. greater because consumers are less sensitive to price changes
D. greater because consumers are more sensitive to price changes.
E. unchanged.

9.



From the above diagram it can be inferred that the elasticity of demand

A. is greater at point Z than at points X and Y
B. is the same at points X, Y and Z.
C. is greater at point Y than at points X and Z
D. is greater than unity at point X and is less than unity at point Z
E. is zero at point Y.

10. Price elasticities of demand for the products of five industries using similar production techniques are shown below. In which industry will an increase in its wages, other things being equal, cause least unemployment?

Industry	Price Elasticity of Demand for the Product
A	0.0
B	0.8
C	1.0
D	1.2
E	Infinity

11. A 100% ad valorem tax rate on a commodity is doubled and the tax revenue doubles. The price elasticity of demand for a commodity is

A. 0.
B. 0.5
C. 1.0
D. 2.0
E. 4.0

12. A consumer's income is £X per week and he spends £¼X on renting a house. His income rises to £2X per week. It is known that his income elasticity of demand for housing is unity. His new level of expenditure on housing will be

A. £1/8 x X.
B. £¼X.
C. £½X
D. £X
E. £1¼X.

13.

Price (pence)	Quantity Demanded (kg)
10	20
9	25
8	30
7	35

For the demand schedule above, in which one of the following ranges does the elasticity of demand lie for a fall in price from 10p to 9p?

A. Greater than or equal to 2.6
B. 2.5 - 1.7
C. 1.6 - 1.2
D. 1.1 - 0.5
E. 0.4 - 0.0

14. A consumer experiences a fall in his income while the prices of the two goods he buys remain constant, (A and B). If he buys the same quantity of A as before

A. the price elasticity of demand for A is higher than that for B
B. the income elasticity of demand for A is unity
C. the income elasticity of demand for A is lower than that for B
D. good A is a luxury and good B is a necessity.
E. the cross elasticity of demand for B with respect to A is less than unity.

15. The following information is known about butter. The demand for butter is negatively related to the price of butter: elasticity -0.43. The demand for butter is also affected by the prices of flour, margarine cakes and meat. Cross elasticities of demand for butter with respect to the prices of these goods are:

flour	-0.23
margarine	0.10
cakes	0.59
meat	0.56

Which one of the following can be predicted from the information?

A. A fall in the price of butter will lead to a more than proportionate rise in the demand for butter.
B. A rise in the price of flour will lead to a rise in the demand for butter.
C. A fall in the price of margarine will lead to a rise in the demand for butter.
D. A fall in the price of cakes will lead to a rise in the demand for butter.
E. A fall in the price of meat will lead to a fall in the demand for butter.

Appendix IV; Test Results

Traditional Method		Case Study Method	
Student	Score	Student	Score
1	13	1	8
2	9	2	6
3	11	3	10
4	10	4	9
5	7	5	9
6	10	6	8
7	9	7	9
8	10	8	7
9	6	9	6
10	8	10	10
11	6	11	8
12	6	12	5
13	10	13	9

Mean (Traditional) = 8.8462 (Mean (Exam Boards) = 8.04)
Variance (Traditional) = 4.2840

Mean (Case Study) = 8.000
Variance (Case Study) = 2.3077

Appendix V : Difference between the scores of matched pairs.

Difference between matched pairs (D)

- 5
- 3
- 1
- 1
2
- 2
0
- 3
0
2
2
- 1
- 1

$\Sigma D = -11$

$\overline{D} = -0.3462$

$s_{\overline{d}} = 2.0323$

$S_d = 2.1153$

$t = \frac{D}{S_d}$

$= -0.4000$

Degrees of Freedom = 12

Appendix VI : An analysis of interaction between treatment and ability

Differences between matched pairs	$H_i - \overline{H}$	$(H_i - \overline{H})^2$
-5	3.3333	11.1109
-3	1.3333	1.7777
-1 'High' ability group (H)	-0.6667	0.4445
-1	-0.6667	0.4445
2	3.6667	13.4447
-2	0.3333	0.1111
	$L_i - \overline{L}$	$(L_i - \overline{L})^2$
0	2.8333	0.0276
-3	-0.1667	0.0278
0	2.1667	4.6946
2 'Low' ability group (L)	2.1667	0.6946
2	-0.8333	0.6944
-1	-0.8333	0.6944
-1		

Mean Difference: Pupils 1 - 6 incl. = 1.6667 = $\overline{H}$

Pupils 8 -13 incl. = 0.1667 = $\overline{L}$

$$t = \frac{\overline{H} - \overline{L}}{\sqrt{\frac{(H_i - \overline{H})^2 = \Sigma(L_i - \overline{L})^2}{N_H + N_6 - 2} \left(\frac{1}{N_H} + \frac{1}{N_L}\right)}}$$

$$= \frac{-1.6667 - -0.1667}{\sqrt{\left(\frac{27.3334 + 18.8333}{10}\right) \left(\frac{2}{6}\right)}}$$

$$= \frac{-1.5003}{\sqrt{4.6167 \times 0.3333}} = \frac{-1.5003}{\sqrt{1.5387}}$$

$$= \frac{-1.5003}{1.2405} = -1.2095$$

Degrees of Freedom = 10

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